

Quality and Total Quality Management (TQM) Notes

Introduction

This document provides comprehensive notes on **Quality Management** and **Total Quality Management (TQM)**, as relevant to the CMA (US) curriculum. These topics focus on ensuring product and service quality, minimizing defects, and enhancing customer satisfaction through systematic processes. The notes correct formatting errors, enhance clarity, and include an example problem integrating quality management with business combinations.

The Costs of Quality

Quality costs are categorized into **costs of conformance** (preventing and detecting defects) and **costs of nonconformance** (fixing defects). These costs are critical for assessing the financial impact of quality initiatives.

Costs of Conformance

- **Prevention Costs:** Incurred to prevent defects before production.
 - Examples: Employee training, quality planning, process design, supplier quality evaluations.
- **Appraisal Costs:** Incurred to assess whether products meet quality standards.
 - Examples: Inspections, testing, quality audits, equipment calibration.

Costs of Nonconformance

- **Internal Failure Costs:** Costs to fix defects discovered before delivery to customers.
 - Examples: Rework, scrap, downtime due to quality issues.
- **External Failure Costs:** Costs to address defects found by customers after delivery.
 - Examples: Warranty claims, returns, customer service costs, lost sales due to reputation damage.

Opportunity Cost of Quality

- Poor quality leads to lost opportunities, such as reduced customer loyalty, lower market share, and time spent correcting defective products.
- Example: A defective product recall may damage brand reputation, leading to lost future sales.

Calculating Cost of Quality (COQ)

- **COQ Report:** Quantifies prevention, appraisal, internal failure, and external failure costs.
- **Format:** Typically presented as a percentage of total sales or production costs, categorized by cost type.
- **Purpose:** Helps management identify high-cost areas and prioritize quality improvements.

Example:

A company reports:

- Prevention: \$50,000 (training, process design)
 - Appraisal: \$30,000 (inspections, testing)
 - Internal Failure: \$20,000 (rework, scrap)
 - External Failure: \$40,000 (warranty, returns)
 - Total COQ: \$140,000
 - Sales: \$1,000,000
 - COQ as % of Sales: $\$140,000 / \$1,000,000 = 14\%$
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Total Quality Management (TQM)

Overview

Total Quality Management (TQM) is a management approach focused on achieving customer satisfaction through continuous improvement and defect prevention. TQM emphasizes doing things right the first time to reduce costs and enhance quality.

Objectives of TQM

- Deliver consistent, high-quality products or services.
- Respond to customer needs promptly and reliably.
- Reduce costs through efficient processes and minimal defects.

Core Principles of TQM

1. **Top Management Commitment:** Active involvement and leadership from executives.
2. **Customer Focus:** Prioritizing customer needs and expectations.
3. **Continuous Improvement (Kaizen):** Ongoing efforts to enhance processes, products, and services.
4. **Employee Involvement:** Engaging all employees in quality initiatives through training and empowerment.
5. **Process-Oriented Approach:** Standardizing and optimizing processes to ensure consistency.
6. **Data-Driven Decision Making:** Using statistical tools to monitor and improve quality.

TQM is Not a Short-Term Project

- TQM requires long-term commitment and organization-wide implementation.
 - It involves cultural change, integrating quality into all aspects of operations.
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Methods of Analyzing Quality Problems

TQM employs statistical tools to identify and address quality issues:

- **Control Charts:** Monitor process stability by plotting data over time to detect variations (e.g., out-of-control points).
- **Histograms:** Display the distribution of quality metrics (e.g., defect rates) to identify patterns.
- **Pareto Charts:** Highlight the most significant causes of defects (80/20 rule).
- **Cause-and-Effect Diagrams (Fishbone):** Identify root causes of quality issues.
- **Scatter Diagrams:** Analyze relationships between variables (e.g., process time vs. defect rate).

TQM and Activity-Based Costing (ABC)

- **Compatibility:** TQM aligns well with **Activity-Based Costing (ABC)** because both focus on activities driving costs and performance.
- **Benefits of ABC in TQM:**
 - Identifies costs of quality-related activities (e.g., inspection, rework).
 - Highlights non-value-adding activities for elimination.
 - Supports TQM's goal of cost reduction and quality improvement.

Example: A manufacturer uses ABC to allocate \$100,000 in quality costs: \$40,000 for inspections (appraisal) and \$60,000 for rework (internal failure). By identifying high rework costs, TQM initiatives focus on improving process design, reducing defects.

Quality Management and Productivity

- **Myth:** High quality is time-consuming and costly.
- **Reality:** Companies prioritizing quality are more productive due to:
 - Fewer defects and less rework.
 - Streamlined processes and reduced waste.
 - Higher customer satisfaction, leading to repeat business.

Example: A TQM-focused company reduces defect rates from 5% to 1%, saving \$50,000 in rework costs and increasing production efficiency by 10%.

Example Problem: Business Combination and Quality Costs

Scenario: A parent company acquires a subsidiary manufacturing two products (A and B). The subsidiary implements TQM and tracks COQ. Post-acquisition, quality training costs increase by 15% due to fair value adjustments. Calculate COQ and allocate to products using ABC, then assess TQM impact.

Data:

- **Pre-Acquisition COQ:**
 - Prevention: \$60,000 (training, process design)
 - Appraisal: \$40,000 (inspections)
 - Internal Failure: \$30,000 (rework)
 - External Failure: \$20,000 (warranty)
 - Total COQ: \$150,000
- **Post-Acquisition:** Prevention costs increase by 15% ($\$60,000 \times 1.15 = \$69,000$).
- **ABC Allocation:**
 - Activities: Inspections (1,000 hours, \$40/hour) and Rework (600 hours, \$50/hour).
 - Product A: 600 inspection hours, 200 rework hours.
 - Product B: 400 inspection hours, 400 rework hours.
- **Sales:** \$1,500,000 (A: \$900,000, B: \$600,000).

Solution:

1. **Post-Acquisition COQ:**
 - Prevention: \$69,000
 - Appraisal: \$40,000
 - Internal Failure: \$30,000
 - External Failure: \$20,000
 - Total COQ: \$159,000
 - COQ as % of Sales: $\$159,000 / \$1,500,000 = 10.6\%$
2. **ABC Allocation:**
 - Inspections: $\$40,000 / 1,000 = \$40/\text{hour}$
 - A: $600 \times \$40 = \$24,000$
 - B: $400 \times \$40 = \$16,000$
 - Rework: $\$30,000 / 600 = \$50/\text{hour}$
 - A: $200 \times \$50 = \$10,000$
 - B: $400 \times \$50 = \$20,000$
 - Total Quality Costs:
 - A: $\$24,000 + \$10,000 = \$34,000$
 - B: $\$16,000 + \$20,000 = \$36,000$

- Remaining Costs (Prevention + External Failure): $\$69,000 + \$20,000 = \$89,000$, allocated by sales:
 - A: $(\$900,000 / \$1,500,000) \times \$89,000 = \$53,400$
 - B: $(\$600,000 / \$1,500,000) \times \$89,000 = \$35,600$
- Total Allocation:
 - A: $\$34,000 + \$53,400 = \$87,400$
 - B: $\$36,000 + \$35,600 = \$71,600$

3. TQM Impact:

- Pre-acquisition defect rate: 5%. Post-TQM implementation, defect rate drops to 2%, reducing internal failure costs by 20% ($\$30,000 \times 0.8 = \$24,000$).
- Savings: \$6,000, reinvested in prevention to further improve quality.
- **Business Combination:** The parent must standardize TQM and ABC practices across subsidiaries, ensuring consistent COQ reporting and fair value adjustments for consolidated financial statements.

Analysis: TQM reduces defects and costs, while ABC provides visibility into quality-related activities. Post-acquisition, aligning quality metrics ensures accurate cost allocation and reporting.

Summary

- **Costs of Quality:** Include prevention, appraisal, internal failure, and external failure costs, tracked via COQ reports.
- **Total Quality Management (TQM):** Focuses on customer satisfaction and continuous improvement through top management commitment, employee involvement, and data-driven processes.
- **TQM and ABC:** ABC enhances TQM by identifying quality-related costs and non-value-adding activities.
- **Quality and Productivity:** High quality improves productivity by reducing defects and waste.
- **Business Combinations:** Require standardized TQM and COQ reporting, with adjustments for fair value to ensure accurate consolidated financial statements.